

Polaroid Radiographs in a Neurosurgical Practice

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THE POLAROID radiographic processor, which is gaining increased acceptance in neurosurgical practice, has been quite well discussed by Wise and Johnston¹ with regard to the general applications of this rapid technique, but its particular uses in neurosurgical practice have not been adequately dealt with.

The use of this method is very simple. The actual mechanics are similar to those of the well-known Polaroid Land camera. The picture is taken with standard radiographic equipment and a special grid cassette. The cassette is loaded with a film packet which contains the chemicals for developing the negative and paper for the final print. Following exposure the packet is removed and placed in the automatic processor which in just 10 seconds delivers a positive image on glossy white paper. As with ordinary polaroid prints, after the film is viewed it is "coated" to give a permanent print.

There are a number of technical advantages in this method. The packets do not have to be stored in darkness and the loading can be done without any darkroom precautions—in the operating room if necessary. By removing the reciprocating grid, the cassette can be used in any standard loading tray and within the cassette is a hinged intensifying screen, which suffices for the exposure. As the processing unit is small, it can be placed on a cart and moved to the area where films are being taken. Here again, no darkroom or other precautions are necessary except to keep unexposed film out of direct exposure. Plugged into the nearest electrical outlet, the processor extracts the print from the cassette and develops the image at the same time. In practice, the unit is usually placed just outside the door of the room in which the patient is being examined and a print is usually ready for viewing in less than one minute.

Besides producing x-ray images rapidly, the method has certain other advantages. Arteriograms and pneumoencephalograms are usually done under anesthesia and the use of the polaroid technique to get "scout" films not only reduces the amount of anesthesia needed but saves time for the physician and money for the patient.

Another advantage is the tendency to improve the quality of the work, since more films can be taken

• The use of the polaroid rapid radiographic method has proven to be very useful in the field of neurosurgery as well as in other fields. It has many wide applications and is gaining increasing popularity. Its numerous advantages far outweigh its minor disadvantages.

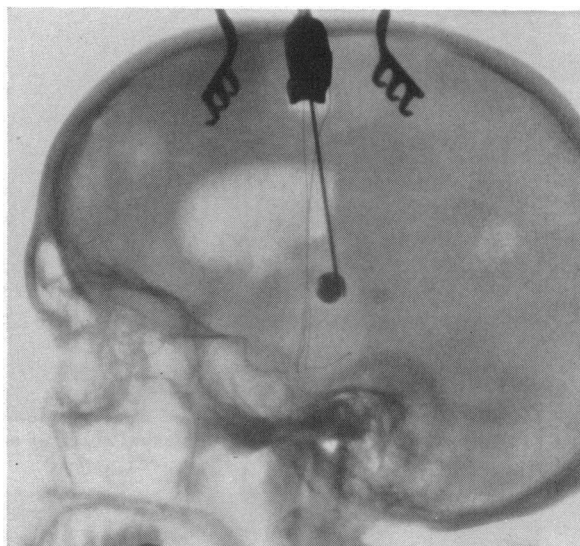


Figure 1.—Ventriculogram on Polaroid film showing air in the ventricular system and foramen of Munro as well as tip of the cannula.

in a shorter time.¹ Also, inasmuch as the paper is much more sensitive than either the conventional or high-speed film, less radiation is required and hence less elaborate protection for the patient and the surgeons.

Technically, the films show fair detail of the dense as well as soft tissue structures, which is usually sufficient since in general they are only used as "scout" films. As yet, the 10 x 12 inch size is the only one available, which may be a disadvantage in certain instances.

In neurosurgery, newer applications of this method seem to be almost limitless. In our practice all the neurosurgical procedures, both diagnostic and operative, are done in the operating room with the exception of routine lumbar punctures, nerve blocks, myelograms and discograms. Because of this arrangement, fluoroscopic and other radiographic adjuncts are not readily available, thus increasing the value of the polaroid technique. We first used it in

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doing stereotactic procedures for Parkinsonism. As can be seen in Figure 1, the detail of the air encephalogram is quite clear, showing the margins of the foramen of Munro and the tip of the Cooper cannula with the balloon inflated. As will be noted, there is a reversal of the normal radiographic appearance in that the dense structures appear dark and the soft tissues light. Some investigators¹ consider this a

slight disadvantage, but with increasing experience this causes the reader little pause. Other uses include checking the position of the needles before injecting a contrast medium for cervical (Figure 2) discographic studies. The method has been especially helpful in providing rapid check films in angiographic procedures. Figure 3 is a film made after a small amount of radiopaque material was injected

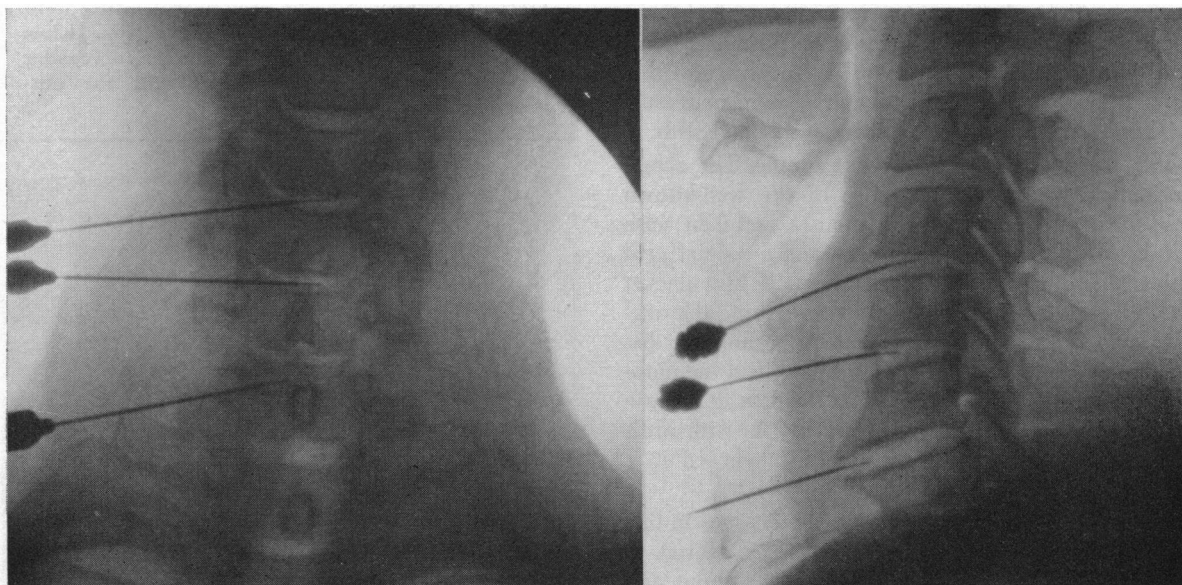


Figure 2.—Polaroid film used for a rapid check of needle position for injecting dye in discographic study.

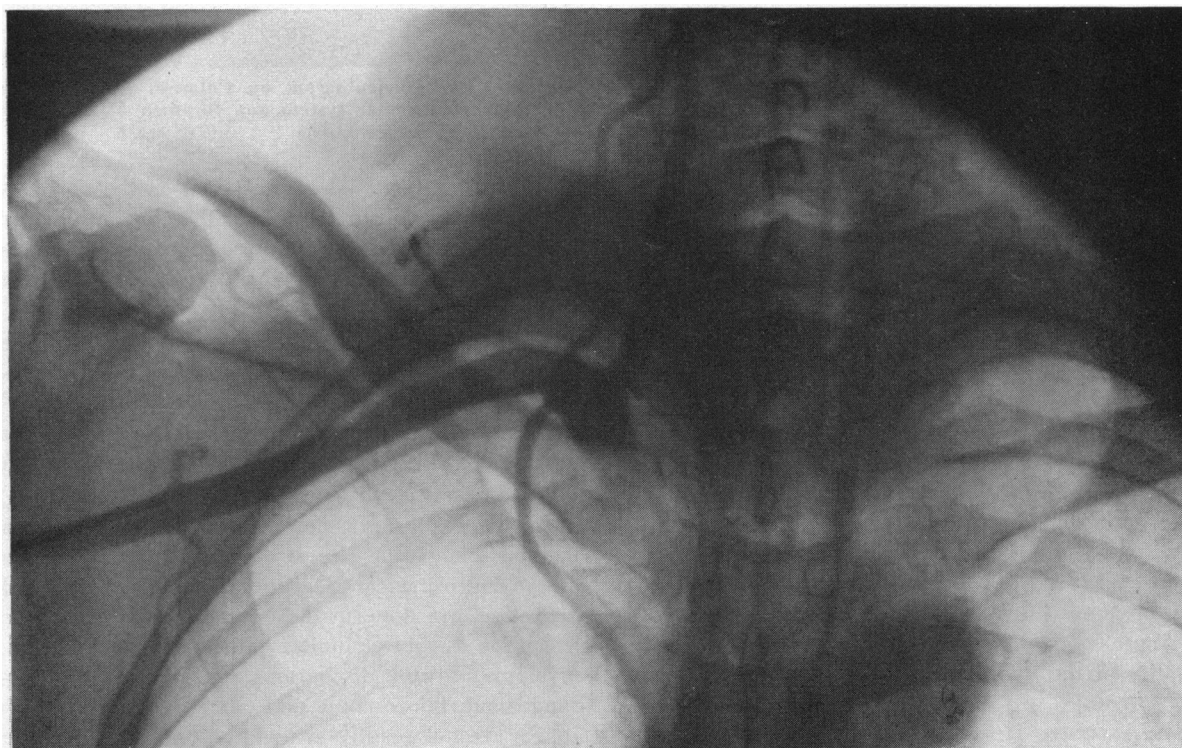


Figure 3.—Spot film to determine point of "take-off" of right vertebral artery before serial angiographic studies.

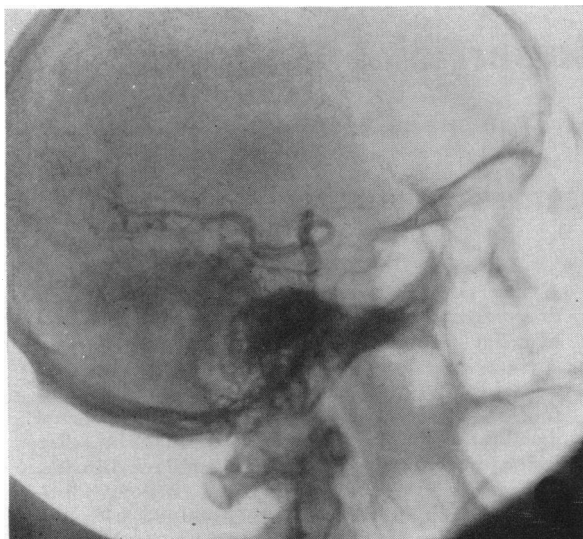


Figure 4.—Vertebral angiogram, lateral view, showing basilar artery and its branches.

into a catheter placed by a transbrachial route to demonstrate the “take-off” of the right vertebral

artery as well as to check the flow into the vertebral artery. Unnecessary and costly serial radiographic exposures can thus be avoided. The same holds true for carotid and other arteriographic studies. We now use it almost routinely to get “bifurcation” views. Figure 4, a lateral view taken shortly after injection by a transbrachial catheter, shows good filling of the basilar artery and its branches.

Other areas in which the polaroid technique has been utilized have been in checking the position of the tip of the catheter in ventriculo-atrial shunts, in pneumoencephalograms to check for ventricular filling, and for localization at the time of operation. Using techniques similar to those for cervical discography, a needle can be placed under direct vision into an interspace to identify the correct level before doing an anterior interbody fusion.

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REFERENCE

1. Wise, R. E. and Johnston, D. O.: Rapid radiographic processing, *Lahey Clinic Bulletin*, 12:130, 1961.

